

Determinants of Household Participation in Rural Development Projects

Daniel Ngugi, University of Georgia, 205 Conner Hall, Athens, Ga, 30605,
Denford Mukundu, Africa University, 1320 Nyanga Rd, Mutare Zimbabwe,
James Epperson, University of Georgia, 315 Conner Hall, Athens, Ga, 30605,
Yvonne Acheampong, American Express Inc., Phoenix, AZ.

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Abstract

This paper provides evidence for determinants of households participation in rural development projects. Study findings are based on qualitative analysis and logistic estimation of a random utility model. Households with higher incomes appear less likely to participate; those with more labor are more likely. Availability of activities of interest to community members could enhance participation.

Introduction

The role of Non Governmental Organizations (NGOs) particularly in low income countries has been to augment government development efforts. Rural areas have received a lot of attention from many NGOs the world over in an effort to improve the living standards of the poor. This is among other things because the bulk of the population in most of these countries lives in the rural areas; for instance in Zimbabwe, about 60% of the people live in the rural areas (Zharare and Chiteka, 1992). Empowering the rural population through self-sustainable projects will go along way in improving the living standards of the rural folk.

Rural development projects (RDPs) have been used by many NGOs as an avenue of operation in pursuit of their goals. But participation of target populations has not always met the expectations of project managers.

This paper is based on a study conducted on a project operated by Christian Care, an NGO operating in Buhera district in the Southeastern part of Zimbabwe, in 1999. The NGO had project activities in a section of Buhera district called “Ward Two”. The objective of the project was to improve peoples’ living standards through investing in natural resource conservation. Initial ideas about the project came from NGO officials who contacted and consulted with community leaders and the government’s Agricultural Extension Services (AGRITEX) officials, before embarking on the project. After arriving at a consensus with community leaders, NGO officials held meetings with the community aimed at sensitizing the later about the need for, and potential benefits of this kind of project in addition to drumming up support for the same.

As part of the project, a vegetable garden was established in every vidco (the ward has ten subdivisions called vidcos; each vidco is further subdivided into several sub-chief areas). Location of the garden was done by a vote of all household heads in the vidco. The rationale behind establishing the gardens at vidco level and not at household level was that it would reduce the amount of trees felled for fencing the gardens. Participants in the vegetable gardening component were also involved in other project activities in their respective vidcos including planting of gum and indigenous trees; filling gullies; marking and demarcating grazing lands; pegging contours; sinking boreholes and creating small dams.

Besides coming up with the idea, the NGO sunk boreholes for watering the gardens, provided organization and leadership training of participants, facilitated establishment of group committees and financed all capital cost to the point at which the project was up and running. Thereafter, the NGO encouraged participants to make monthly contributions to meet project operation costs.

Despite all the efforts, the NGO faced problems of unwillingness of community members to participate in this development project. At the beginning of 1999, a study was carried out to find out why members of the target population failed to participate in the project.

The problem of low participation of the target population in community development projects is not unique to this particular NGO; to the contrary, it is a common problem among NGOs (Ukpong, 1993; Mulwa, 1988). Thus, although the findings of this study may not be generalized to all rural development projects, there is an extent to which results could apply to many community development initiatives whether they be initiated by governments or NGOs.

Objectives

The objective of this paper is to explore and provide empirical evidence for the factors that contribute to rural households decision to participate in rural development projects. The findings of this study would be useful in assisting rural development projects to be more focused in their selection of target populations and may be achieve higher participation.

Data and Methods:

Data collection for this study involved focus group discussions and a survey. Focus group discussions were held with the NGO and AGRITEX officials to elicit information on general organization and workings of the NGO among the community. A semi-structured questionnaire was pre-tested, revised and used to survey household heads and collect data on household characteristics, household head attributes, their perception of the operations of the project and the reasons for nonparticipation of some community members.

The household was used as the basic unit of study. The sampling frame for the survey was a list of households provided by the local community leadership. A sample of 100 households was selected using systematic random sampling procedure. Focus group discussions were used to elicit possible responses about reasons for nonparticipation. A list of possible responses was compiled for use with the questionnaire; provision was made for variation of responses.

Theoretical and Empirical Models

From a theoretical perspective the decision to participate in the community development project can be viewed as being driven by how much utility a household gains from its choice. Utility is viewed as an unobservable index determined by a set of explanatory variables that an individual uses to rank a set of decision alternatives. Because it is unobserved, utility can be treated as a random variable, and the dichotomous choice decision, to participate or not, can be analyzed using a random utility model. This approach is common among studies of participation and technology adoption behavior (Rahm and Huffman, 1984; Collins, et, al, 1999; Hoag, Ascough II, and Frasier, 1999). The random utility model is herein used to evaluate the probability that a household will decide to participate in the project based on a set of explanatory variables.

We envisage an indirect utility function where utility depends on a vector of personal attributes of the i th household head, H_i (such as age, gender, education, occupation, and marital status) and a vector of the i th household features, Z_i (such as household size, housing type, land size, income, livestock and asset ownership).

The indirect utility function F for the i th household can be expressed as:

$$(1) V_{it} = \beta_t F_t(X_i) + \varepsilon_{it} \quad t = 1, 0; i = 1, \dots, n; X_i = (H_i, Z_i),$$

where t represents the households choice to participate ($t = 1$) or not ($t = 0$); V_{it} is the indirect utility function for the household; X_i is a vector of characteristics of the i th

household (H_i and Z_i defined above); β is a vector of parameters of the model and ε is the error term.

The utilities (V_{it} s) are random, and the i th household chooses to participate if $V_{1i} > V_{0i}$; the latent random variable $y_i^* = 1$ if $(V_{1i} - V_{0i}) > 0$, $y_i^* = 0$ otherwise. The probability that the latent variable equals 1 can be expressed as:

$$(2) P_i = P_r(y_i^* = 1) = P_r(V_{1i} > V_{0i})$$

where P_i is the probability of the i th household participating.

This can be further expressed in equation (3) and (4) below as a function of the independent variables, that is,

$$(3) P_i = \beta_1 F_i(X_i) + \varepsilon_{1i} > \beta_0 F_i(X_i) + \varepsilon_{0i} \\ = P_r\{(\varepsilon_{1i} - \varepsilon_{0i}) > (\beta_0 F_i(X_i) - \beta_1 F_i(X_i))\}$$

$$(4) P_i = P_r\{\mu_i > \alpha F_i(X_i)\} \\ = F(X_i' \alpha)$$

where $\mu_i = (\varepsilon_{1i} - \varepsilon_{0i})$ is a random error term, $\alpha = (\beta_0 - \beta_1)$ is a vector of parameters to be estimated, $F(X_i' \beta)$ is the cumulative distribution function (cdf) of the error term μ_i evaluated at $X_i' \beta$, the rest of the terms are as defined earlier.

Defining the utility index for household i as $I_i = X_i' \beta$, we assume that there exists a threshold level of the index, I_i^* , above which the household participates otherwise it does not. We can translate the index I into a 0,1 range using the (cdf) so that:

$$(5) P_i = \Pr(Y_i = 1)$$

$$(6) \quad P_i = \Pr(I_i^* \leq I_i) = F(I_i) = F(X_i' \beta),$$

where Y_i is the decision variable for the i th household.

Two alternative choices for the cdf, (normal and logistic), have been used in literature depending on the assumptions made about the distribution of the error term μ_i above - the choice of one or the other makes no difference. We opt for the logistic distribution which gives us:

$$(7) \quad \Pr(Y_i=1) = F(X_i' \beta) = 1/(1 + \exp(-X_i' \beta)) .$$

Thus we can assume that the i th household decides to participate if:

$$(8) \quad Y_i=1 = X_i' \beta + \varepsilon_i > I_i^* , \text{ otherwise not to participate.}$$

We further assume ε_i follows a logistic distribution and apply logistic regression estimation using maximum likelihood method to analyse the random utility model. For our analysis we used a dummy for participation status (1 for participating , 0 for non-participating) as the dependant variable. The independent variables were household head attributes and households characteristics outlined earlier. Elasticity at means measure percentage change in the probability of choice in response to a percentage change in the explanatory variable and is estimated as follows from White (1996):

$$(9) \quad E_k = \left[\frac{\delta P_i}{\delta X_{ki}} \right] \frac{X_{ki}}{F(-X_i' \beta)} , k=1, \dots, k \text{ independent variables.}$$

where E_k is the elasticity, the rest of the terms are as defined earlier.

Goodness of fit of a logit regression model is examined using various pseudo R-squared statistics including the Cragg-Uhler R-squared and the Maddala R-squared (White). A

significant R-squared implies that the regression is not a bad fit . The number of correct predictions given by the model can also be used to assess model performance and goodness of fit.

A distinguishing feature among most project activities is that either the benefits accrued more at community than household level or benefits would not be realized in the very “short run”; in a growing season or a year. Activities like filling gullies (say on communal land or along the roads), marking grazing lands would benefit the entire community. On the other hand the benefits of vegetable gardening and associated irrigation initiatives like sinking boreholes and creating small dams would only be realized in the short run if demand for vegetables in the area was high. Besides, trees would take time, even years, to mature before providing returns to household labor. The question of benefits accruing at more community level introduces the free rider problem, but this could be overcome if the benefits of vegetable gardening are significant. Another unique feature of all activities was that they were labor intensive which would imply a constraint for labor deficient households.

Literature on determinants of participation in community projects is scanty. Nevertheless there is quite some literature on adoption of technology among farm communities and although the two issues are not identical, there are enough similarities to warrant borrowing from the later. Such borrowing cannot be wholesale particularly because benefits of farm technology adoption are observed in the a season or a year and at household level whereas

those that are the subject of this paper accrue mostly at community level and take longer to be realized.

In most rural communities in Africa, major household decisions like whether to participate in community activities are made by the household head often with the input of the spouse. Household head attributes such as age, gender and occupation are therefore important factors in analyzing the participation decision.

Studies in Zambia show that female headed households (FHHs) are more likely to adopt resource conservation/improvement technology than male headed households (MHHs) holding other factors like household size and age constant (Thangata, Hildebrand and Gladwin, 2002). But FHHs are often more resource constrained particularly with regard to labor and cash than their counterpart MHHs (Thangata, Hildebrandt and Gladwin, 2002; Gladwin, Peterson and Uttaro, 2002) and this may be a hindrance to participation in the community development project in question. It is hard to tell apriori if the effect that gender of household head would have on participation.

Age is another crucial factor that could affect participation. It is again hard to tell what effect this factor would have on participation. On the one hand as a measure of experience including the losses associated with failing to adopt technology early, age could have a positive effect on participation (Kenkel and Norris, 1995; Collins et, al., 1999). On the other

hand older farmers are likely to be more risk averse and more resistant to change (Turner Epperson and Fletcher, 1983) and therefore be reluctant to participate. Many studies have found age to be negatively related to farm technology adoption (Turner et al, 1983; Amponsah, 1985).

Occupation of household head is another factor that may affect participation. One would expect that since the projects have to do with farming, households whose heads are farmers would be more likely to participate. Education of the household head often influences adoption of technology positively (Hoag, Ascough II, and Frasier, 1999; Pitt and Sumodiningrat, 1991) since heads with more years of schooling would be expected to better visualize the benefits of technology. But given the nature of benefits and the time it takes to realize them, we expect that more educated household heads would have a higher opportunity cost of labor, hence this variable would be negatively related to participation.

Marital status is another factor that could affect participation. Households where the head and spouse live together are likely to have more labor available and therefore more likely to participate in NGO activities. But it is arguable that it is only when married couples are de-facto living together that the benefits of increased labor supply are realized. We therefore included a variable for de-facto marital status (married and living together) in our logit model.

Important household characteristics include income, size (number of members); farm or cropland size (in acres of crop land available to the household); housing type (construction materials used); household asset and livestock ownership.

Conventional wisdom and past studies suggest that household with higher incomes would be more likely to participate than those with lower incomes since the former would even hire labor if they were constrained in that direction (Thangata, Hildebrand and Gladwin, 2002). But the unique nature of the projects in question calls for a rethinking of the matter. One would imagine that household with higher incomes would have higher opportunity cost of their labor and would not be willing to hire labor for the projects unless the returns were higher than the cost of labor at the least which may not be a realistic expectation for a young project of this nature. Livestock and asset ownership were used in this study as a proxy for wealth. It is hard to tell a priori what effect wealth would have on participation. But ownership of such assets as oxen and ploughs would possibly imply lower demand for human labor on the farm hence increased participation.

Household size has been observed to have a positive relationship to technology adoption (Gladwin, Peterson and Uttaro, 2002) since larger households means more labor. It is expected that larger households would show more willingness to participate in project activities.

Large farm sizes have been associated with higher conservation technology adoption (Gladwin, Peterson and Uttaro, 2002) and even other farm technology adoption (Rook and Carson, 1985; Hoag, Ascough II and Frasier, 1999). Land in the area of study is communal

with the subchief dividing out crop land among household on the basis of household size. Therefore the effect of this factor might follow or even be confounded by that of household size.

Given the documented difficulty of eliciting valid responses on rural household income in developing countries, information on annual household expenditure was collected and used as a proxy for income. Participants were asked about their perceptions of reasons for non-participation and non-participants were asked why they did not participate.

A number of independent variables were highly correlated and there was need to avoid multicollinearity during analysis. Factor analysis is a useful tool to reduce the number of independent variables used in regression studies (Johnson and Wichern, 1998), a technique that is common for dealing with multicollinearity (Gujarati, 1995). But there are criticisms to the method stemming mainly from the fact that factors resulting from the analysis do not always make sense (Johnson and Wichern). We intended to use factor analysis to simply point out variables with strong and logical relationships. As it turned out the method gave us logical and relationships between household assets and also between farm implements.

The final list of independent variables and the expected signs was as follows: income (unclear); a weighted average of household assets (-); household size (+); a weighted average of agricultural implements (+); age (+); gender, 1 for male, 0 for female (unclear); marital status dummy with 1 for married, 0 otherwise(+); de-facto marriage status, dummy with 1 for married and living together, 0 otherwise; occupation dummy with 1 for farmer, 0 otherwise (-); education/years of schooling (+/-); cropland size (+); housing type dummy

with 1 for thatch roof and 0 otherwise(-). Qualitative analysis was carried out to further explore the reasons for participation/non-participation.

Analysis of the Logit model applied stepwise regression procedures to choose the most important variables using a retention point of 25% significance, the rest being finally dropped from the equation.

Results

In response to the question why they did not participate in project activities, about 40% of nonparticipants said there were no significant financial gain; 36% said the activity sites were too far from their homes; 10% said the project had no activities of interest to them while the rest (14%) gave other reasons. All non-participating household heads in the age bracket 16 to 30 years said the reason for their failure to participate was absence of activities of interest to young people and about all of them voiced concerns that they were uncomfortable working with older people. This can be explained by cultural norms that call for a respectable distance and relationship between the young and old. From an African perspective it is understandable that young people were uncomfortable working closely with older people especially in the setting of project activities. Among participants, about 32% gave absence of significant financial gain as their perceived reasons for failure of non-participants to participate; 16% said non-participants were simply lazy; the rest cited other reasons.

About 88% of non-participants said they would join the projects if there were activities of interest to them; 10% said they would only join if the projects were in their subchief areas indicating socio-political tensions, while 2% said they would not join at all. The type of activities they were interested in varied by gender and age. About 54% indicated they would want to be involved in poultry production; 18% in gardening; 12% in cattle fattening and the rest in diverse activities. Men wanted to be involved in pig and cattle fattening and poultry production; younger people (16-30 years) in gardening, poultry production and carpentry while women wanted to be involved in gardening, sewing and poultry.

It would appear that lack of activities of choice and little potential for personal gain was a major cause of non-participation, followed may be by lack of separate groups for the young and old. Poor socio-political cohesion also seems to have played a role in discouraging participation.

An overwhelming majority of respondents(96%) said that NGO officials consulted widely with community members before initiating project activities; both NGO and AGRITEX officials confirmed this during focus group discussions. During meetings with community members, NGO officials had sensitized the former on the need to protect the environment, and how project activities would be useful in realizing this objective. The officials also introduced proposed project activities. Nonetheless focus group discussions revealed that the choice of project activities was done by NGO officials with little input from community leaders.

It was apparent from both interviews with participants and focus group discussions with officials that community members had been trained in project group management and organization. Most of the participants (98%) also indicated they had working committees and were using a set of by laws to guide group operations. About 88% indicated they met regularly, 74% indicated they had not found it necessary to change group leaders and 26% had elected new leaders in the course of project implementation.

Examining the logistic regression model reveals that it has a significant Likelihood Ratio chi-square and leads us to reject the hypothesis that all estimated coefficients are equal to zero. The Hosmer and Lemeshow chi-square was also significant (at 5%) leading to rejection of the hypothesis that the model was unfit.

Results of the logistic regression model (Table 1) showed a negative and significant (at 5%) sign on income implying that *ceteris paribus*, households with lower income were more likely to participate in the project than higher income households. This is consistent with the major reasons given for non-participation – insufficient financial gain. Higher income households would have greater opportunity cost of labor.

There were positive and significant signs on de-facto marital status, and household size at 5% level, meaning that holding other things constant, households where the couple was both married and actually living together had a higher probability of participating than otherwise and larger households had a higher probability of participating than smaller ones. All the

other variables were dropped by the stepwise regression procedure being non-significant even at the 10% level.

Table 1: logistic regression estimates

Variable	Estimate	Elasticity at means	p-value
Intercept	8.1915	0.53234	0.0230
Age of household head	0.0377	0.79011	0.2018
Household income	-1.2232*	-5.7574	0.0026
De-facto marital status	1.0731*	0.30263	0.0266
Household size	0.2879*	4.1251	0.0214

* significant at 5% level

Cragg-Uhler R-squared value was about 30.4%, Maddala R-squared was about 22.8% both suggesting that the regression was not a bad fit. The model predicted 70% of the observations correctly again indicating a fair performance.

Discussion

This study reveals three major factors that appear to determine participation in rural development projects, namely household income, household size and de-facto marital status. Households with higher income seem less likely to participate in RDPs contrary to the findings of other studies on technology adoption. This underscores the unique features of this study outlined earlier.

Larger households had by implication more labor available to them; it was sufficient both for their use and for contribution to the community project pool. Households with couples,

married, and actually living together were more likely to participate than those married and living separately for whatever reasons, those whose marriage partners were deceased or those that were single. It may imply that de-facto married couples were able to reap the benefits of greater labor supply availed by the arrangement. These results seem to imply that labor availability was the most important factor in determining participation.

Although NGO officials consulted widely with members of the community before initiating the project, there appears to be some disparity between current project activities and those that non-participating community members would want to be involved. This disparity could be explained by the fact that community members were not consulted with regard to activities of their choice. For instance a number of activities that non-participants indicated they would want to be involved in including pig and cattle fattening and poultry production were not among those currently undertaken by the project. A number of studies (Mulwa, 1988; Salole, 1991; Ukpogon, 1993) have observed this kind of disparity as a source of failure for many NGO and other institutional community development initiatives.

The fact that there were no separate activities for younger members of the community curtailed their participation due to expected cultural distance between the old and young. Lack of cohesiveness among different sub-chief areas pointed to socio-political problems, but these seem to have been minor causes of concern among both participants and non-participants.

By and large the typical rural household that will participate in RDPs where benefits are realised more at community level and not in the “short run” are more likely to be big, headed by an older person and in the lower income bracket.

Conclusion and Implications

The objectives of this paper is to explore and provide empirical evidence for the factors that contribute to rural households decision to participate in rural development projects. A survey and focus group discussions were used to elicit information from participants, non-participants NGO and public service officials. Logistic regression estimation using maximum likelihood method was used to analyze a random utility model and examine factors that contribute to participation. Simple statistics and qualitative analysis of focus group discussions were also employed

This study reveals three major factors that appear to determine participation in rural development projects, namely household income, household size and marital status where couples both married and actually living together (de-facto marital status). It appears that households with higher income are less likely to participate in RDPs while larger households and those with older heads are more likely to participate. Although the process of initiating members into the projects entailed wide consultation at community level, it seems that lack of involvement of community members in choosing project activities was apparent and contributed to low participation.

In addition, the prospect of sufficient financial gain as well as availability of activities that are attractive to the majority of the target population are of great importance in attracting people to participate in RDPs. These study findings underscore the importance of participatory development that seeks to involve communities in the entire development process especially in the choice of project activities. It seems that setting up groups that were more culturally, socially and politically cohesive would also contribute to greater participation.

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